

A REVIEW OF THE STONEFLY GENUS *PARANEMOURA* (PLECOPTERA:
NEMOURIDAE) AND A NEW SPECIES FROM THE NORTHEAST

RICHARD W. BAUMANN

Department of Zoology, Brigham Young University, Provo, UT 84602, U.S.A.

Abstract.—*Paranemoura perfecta* (Walker) is reviewed and a second species, *P. claasseni*, n. sp., is described from northeastern North America. Illustrations of the adult terminalia and wings of both *P. perfecta* and *P. claasseni* are provided. A diagnosis serves to separate the two species in the male adult stage. Distributional data are included for both species and also for females that could only be determined to genus. Results show that the genus is restricted to eastern North America and that *P. claasseni* only occurs in more northern localities.

Key Words: Plecoptera, stoneflies, Nemouridae, *Paranemoura*, new species, Nearctic.

The subgenus *Paranemoura* was erected without comment by Needham and Claassen (1925) for a single species, *Nemoura punctipennis* Claassen (1923), described from New York. Ricker (1938) studied the *Nemoura perfecta* Walker type from Nova Scotia in the British Museum and placed *N. punctipennis* as a synonym under *N. perfecta*. Ricker (1952) recognized *Paranemoura* as a monotypic subgenus and gave additional distribution data for Maine and North Carolina. *Paranemoura* was raised to generic status by Illies (1966) and it has remained monotypic and relatively poorly known even though Stark et al. (1986) indicated that *P. perfecta* was known from Connecticut (Hitchcock 1974), Maine, New York, Ontario (Harper and Hynes 1971), Pennsylvania (Surdick and Kim 1976), Quebec (Ricker et al. 1968), Virginia (Kondratieff and Voshell 1979) and West Virginia.

This paper includes the description of a second species in the genus *Paranemoura* and provides distribution information for both species. *Paranemoura punctipennis* is confirmed as a junior synonym of *P. perfecta*.

Paranemoura perfecta (Walker)

Figs. 1–3, 7–9, 13, 15

Nemoura perfecta Walker, 1852: 191.

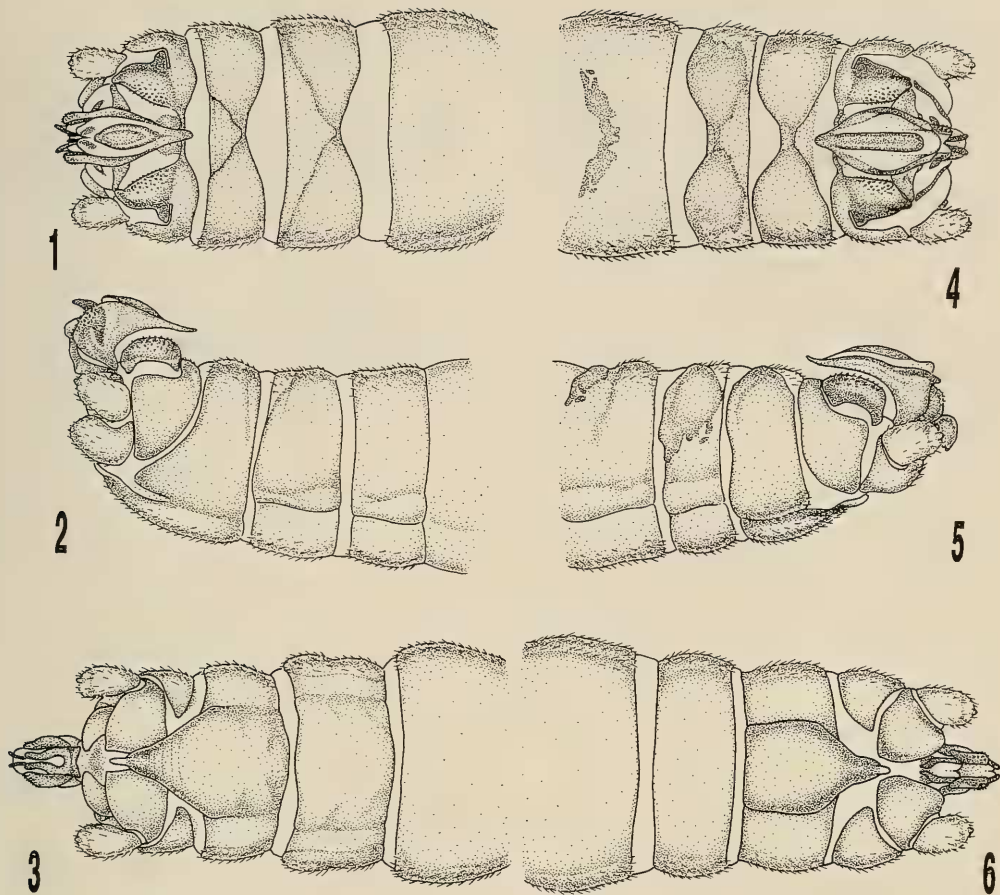
Holotype male: Nova Scotia: Redman (TNHM), examined.

Nemoura punctipennis Claassen, 1923: 291.

Holotype male: New York: Axton, Adirondack Park, 12–22 June 1901 (CUIC), examined.

Recognition.—*Paranemoura perfecta* is very distinctive in the structure of the male epiproct. The sclerotized portion of the dorsal sclerite (epihook) is sharply pointed at the tip, where it rotates between the base of the ventral sclerite (Figs. 7, 8). In addition, the lateral basal profiles of the ventral sclerite are smoothly rounded from the base to the dorsal surface (Fig. 8). The female is difficult to separate without associated males (Fig. 13).

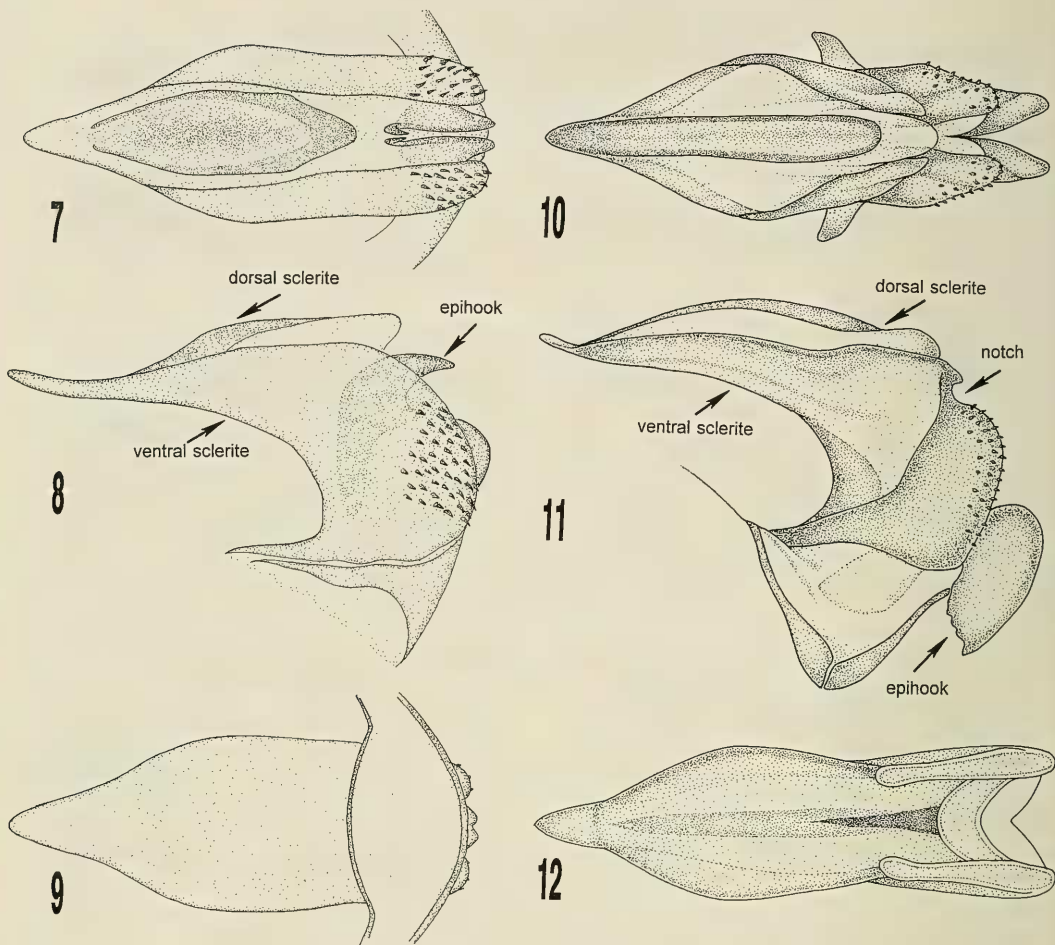
Distribution.—The following specimens were confirmed as part of this study based on the examination of male specimens: CANADA: NEW BRUNSWICK: Charlotte Co., tributary of Digdequash River, Hwy 127, south of Dumbarton, 15-VI-1993, R.W. Baumann and B.C. Kondratieff, 2 ♂.



Figs. 1-6. 1-3, *Paranemoura perfecta*, male terminalia. 1, Dorsal view. 2, Lateral view. 3, Ventral view. 4-6, *P. claasseni*, male terminalia. 4, Dorsal view. 5, Lateral view. 6, Ventral view.

Northumberland Co., Big Eskedelloc River, Hwy 8, 17-VI-1993, R.W. Baumann and B.C. Kondratieff, 1 ♂. York Co., tributary of Magaguadavic River, Hwy 3, southeast of Thomston Corner, 14-VI-1993, R.W. Baumann and B.C. Kondratieff, 3 ♂. NOVA SCOTIA: Annapolis Co., Roop Brook, off Hwy 10, above Springfield Lake, 23-VI-1993, R.W. Baumann and B.C. Kondratieff, 3 ♂, 4 ♀. Cape Breton Co., Baddeck, Cape Breton Island, 22-VI-1936, J. McDunnough, 1 ♂, 4 ♀. Guysborough Co., Silvey Brook, Hwy 16, north of Lincolnville, 22-VI-1993, R.W. Baumann and B.C. Kondratieff, 24 ♂, 27 ♀. Kings Co., Butler Brook, below Burke Lake, Dalhousie Road, 23-VI-1993, R.W.

Baumann and B.C. Kondratieff, 1 ♂. Yarmouth Co., Bear Lake Brook, Hwy 203, above Second Bear Lake, 24-VI-1993, R.W. Baumann and B.C. Kondratieff, 1 ♂, 5 ♀; Clyde River, Hwy 203, Flintstone Rock, 24-VI-1993, R.W. Baumann and B.C. Kondratieff, 1 ♂. ONTARIO: Hastings Co., 2 miles east of New Carlow, 21-IV-1968, W.E. Ricker, 1 ♂, 2 ♀. Lennox and Addington Co., 4 miles east of Vennachar, 21-IV-1968, W.E. Ricker, 1 ♂. Nipissing Co., Costello Lake, Algonquin Park, 15-V-1940, W.M. Spurles, 1 ♂. PRINCE EDWARD ISLAND: Prince Co., headwaters Grand River, Hwy 177, south of Wellington, 18-VI-1993, R.W. Baumann and B.C. Kondratieff, 2 ♂. QUEBEC:



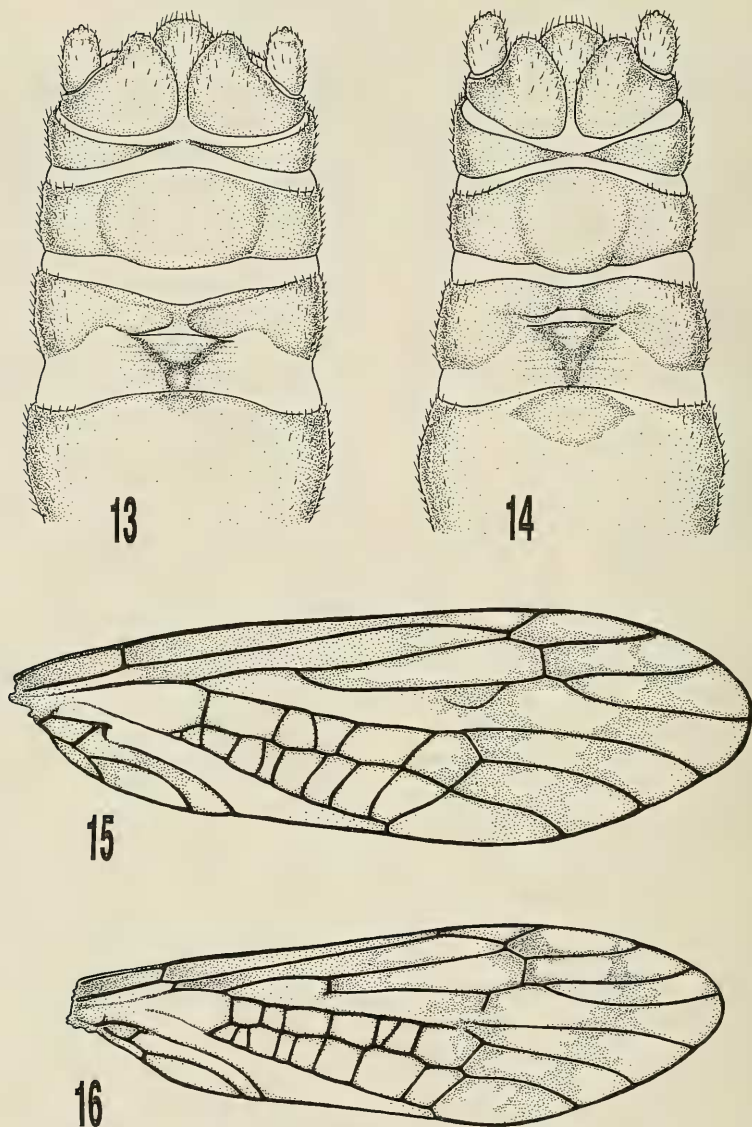
Figs. 7-12. 7-9, *Paranemoura perfecta*, male epiproct. 7, Dorsal view. 8, Lateral view. 9, Ventral view. 10-12, *P. claasseni*, male epiproct. 10, Dorsal view. 11, Lateral view. 12, Ventral view.

Joliette Co., Mont Tremblant Park: 19-V-1954, A. Robert, 1 ♂, 5 ♀; Baie des Aulnes, 21-V-1954, 1 ♂. Témiscamingue Co., Laniel, 27-VI-1939, F.P. Ide, 1 ♂, 1 ♀. Terrebonne Co., University of Montreal Biological Station: St. Hippolyte de Kilkenny, 22-V-1964, L. Venne, 1 ♂, 1 ♀; 2-V-1966, P.P. Harper, 2 ♂, 1 ♀; Lac Long, St. Hippolyte, 3-V-1966, P.P. Harper, 3 ♂, 1 ♀; 26-V-1966, 5 ♂; tributary du Lac Cromwell, St. Hippolyte, 14-V-1966, P.P. Harper, 2 ♂, 2 ♀; 10-V-1967, 24 ♂, 22 ♀. UNITED STATES: CONNECTICUT: Fairfield Co., Wolcott, 3-V-1959, S.W. Hitchcock, 1 ♂; Redding Ridge, 13-VI-

1960, S.W. Hitchcock, 1 ♂; Saugatuck River, Hwy 53, Redding, 8-IV-1963, S.W. Hitchcock, 1 ♂; Aspetnek River, Easton, 5-IV-1966, S.W. Hitchcock, 1 ♂; drought stream, upper Easton, 5-IV-1966, S.W. Hitchcock, 1 ♂. Hartford Co., Staffordville, 23-IV-1964, S.W. Hitchcock, 1 ♂; Fenton River, East Willington, 5-IV-1968, S.W. Hitchcock, 2 ♂. Middlesex Co., Menunketesuck River, Killingworth, 1-IV-1965, S.W. Hitchcock, 17 ♂, 8 ♀; 5-IV-1965, 6 ♂, 17 ♀; 8-IV-1965, 1 ♂, 3 ♀; 7-IV-1969, 1 ♂. New London Co., Pachang State Forest, near Voluntown, 23-V-1966, S.W. Hitchcock, 1 ♂. MAINE: Aroostook

Co., Oxbow, on drop nets, 4-14-VI-1970, D.E. Leonard, 1 ♂, 1 ♀. Hancock Co., Mud Pond Stream, 1 mile south of Tunk Mountain, 9-VI-1982, T.M. Mingo, 2 ♂, 5 ♀; 6-VII-1982, 2 ♂, 2 ♀; Salmon Pond Stream, 1 mile south of Tunk Mountain, 7-VII-1982, T.M. Mingo, 1 ♂; Piscataquis Co., tributary Katahdin Stream, Baxter State Park, 4-V-1980, T.M. Mingo, 1 ♂; Squaw Brook, Hwy 15, below Big Squaw Mountain Ski Resort, 12-VI-1993, R.W. Baumann, B.C. Kondratieff and D.S. Potter, 1 ♂, 12 ♀. Waldo Co., seepage stream, City Point, Belfast, 25-V-1993, D.S. Potter, 1 ♂; Wing Brook, Thorndike, 13-VI-1993, R.W. Baumann, B.C. Kondratieff and D.S. Potter, 52 ♂, 29 ♀. MASSACHUSETTS: Middlesex Co., Medford, Border Road, 27-III-1954, J.F. Hanson, 7 ♂, 20 ♀; 10-IV-1956, 1 ♂, 1 ♀. MARYLAND: Allegany Co., tributary Fifteen Mile Creek, Hwy 144, 12-III-1995, S.A. Grubbs, 1 ♂; 13-IV-1996, 1 ♂. Fredrick Co., Big Hunting Creek, from trout stomach, 9-IV-1988, R.M. Duffield, 1 ♂, 1 ♀. NEW HAMPSHIRE: Grafton Co., Fox Inlet, Plymouth, 25-IV-1969, G. Wilson, 3 ♂, 1 ♀. NEW YORK: Carraraugus Co., tributary Stoddard Brook, Adirondack State Park, 24-IV-1963, L.L. Pechuman, 1 ♂, 1 ♀. Essex Co., Gill Brook, tributary East Branch Ausable River, southwest of Saint Huberts, Adirondack Park, 29-IV-1991, R.W. Baumann and M.F. Whiting, 4 ♂, 7 ♀. Franklin Co., Axton, Adirondack Park, 12-22-VI-1901, A.D. McG. and C.O.H., 1 ♂, 3 ♀ (*N. punctipennis* types). Hamilton Co., Salmon River, Hwy 30, below Salmon Pond, Adirondack Park, 29-IV-1991, R.W. Baumann and M.F. Whiting, 2 ♂, 2 ♀; Hatchery Brook, Hwy 30, northwest of Speculator, Adirondack Park, 30-IV-1991, R.W. Baumann and M.F. Whiting, 1 ♂, 2 ♀. NORTH CAROLINA: Watanga Co., Blowing Rock, 23-III-1940, T.H. Frison, C.O. Mohr and A.W. Hawkins, 2 ♂. PENNSYLVANIA: Forest Co., Clarion River, Greenwood Road, 11-IV-1996, E.C. Masteller, 1 ♂. Franklin Co., Dothan Run,

25-IV-1994, J.I. Earle, 1 ♂. Huntingdon Co., Whipple Dam State Park, 22-III-1953, S.W. Frost, 1 ♂; Aughwick Creek, Runk Road, 12-IV-1996, E.C. Masteller, 1 ♂. Pike Co., 4 miles south of Hawley, Hwy 6, 19-IV-1966, L.L. Pechuman, 2 ♂. Westmoreland Co., Major Spring, Powdermill Nature Reserve, 7-IV-1993, S.A. Grubbs, 4 ♂; 28-IV-1993, 1 ♂; seep, Hwy 381, .5 miles north of Hwy 31, 7-IV-1995, S.A. Grubbs and J.I. Earle, 1 ♂. TENNESSEE: Hamilton Co., Chickamanga Creek, Hwy 27, Soddy-Daisy, 29-III-1996, C.H. and E.S. Nelson, 2 ♂. VERMONT: Bennington Co., Red Mill Brook, Hwy 9, below Red Mill Pond, 27-IV-1991, R.W. Baumann and M.F. Whiting, 2 ♂, 1 ♀; West Branch Deerfield River, Hwy 8, Heartwellville, 27-IV-1991, R.W. Baumann and M.F. Whiting, 9 ♂, 13 ♀. VIRGINIA: Bath Co., Back Creek, 1-IV-1972, G. Simmons, 1 ♂. Craig Co., Johns Creek, Hwy 658, 16-III-1980, B.C. Kondratieff, 5 ♂. Giles Co., Mountain Lake, 9-IV-1977, M. Meschter, 3 ♂, 2 ♀. Montgomery Co., Toms Creek, Hwy 655, at junction Hwy 781, 30-III-1980, B.C. Kondratieff, 5 ♂, 2 ♀. Smyth Co., tributary Grindstone Branch, Grindstone Campground, Mount Rogers Recreation Area, 13-II-1980, B.C. Kondratieff, 1 ♂. Southampton Co., Nottoway River, Hwy 653, Carys Bridge, near Capron, 9-III-1991, R.W. Baumann and R.F. Kirchner, 1 ♂. Wythe Co., East Fork Stony Fork, Reed Creek, Hwy 717, Jefferson National Forest, 11-III-1991, R.W. Baumann and R.F. Kirchner, 1 ♂, 3 ♀. WEST VIRGINIA: Pocahontas Co., Sugar Creek, tributary Williams River, Monongahela National Forest, 3-V-1981, R.F. Kirchner, 3 ♂, 3 ♀; headwaters Sugar Creek, Hwy 76, off Hwy 151, 14-V-1990, R.W. Baumann, R.F. Kirchner and B.C. Kondratieff, 1 ♂, 7 ♀; 24-V-1994, R.F. Kirchner and B.C. Kondratieff, 27 ♂, 48 ♀; spring tributary Charles Creek, Cranberry Glades, 24-IV-1994, R.F. Kirchner and B.C. Kondratieff, 31 ♂, 5 ♀. Randolph Co.,



Figs. 13–16. 13, 14, *Paranemoura*, female terminalia. 13, *P. perfecta*, ventral view. 14, *P. claasseni*, ventral view. 15, 16, *Paranemoura* wings. 15, *P. perfecta*, right forewing. 16, *P. claasseni*, right forewing.

Marsh Fork Buckhannon River, Hwy 47, near Pickens, 24-III-1992, S.M. Clark, 1 ♂.

***Paranemoura claasseni* Baumann,
New Species**

Figs. 4–6, 10–12, 14, 16

Male: Macropterous or slightly brachypterous, wings reaching just beyond tip of abdomen; length of forewings 4.5–5.5 mm; length of body 6.0–7.0 mm. Body and legs

light brown, coloration darker on head, thorax and tip of abdomen; wings brown, with darkly mottled patches along costa, and just before and just after cord, apical costal crossvein absent so typical nemourid “X” is missing, many small cubital cells present beyond arc (Fig. 16). Head broad in occipital area, eyes large, anterior margin of pronotum, where it joins head, very narrow. Anterior median margins of abdominal ter-

ga 6 and 7 as darkly sclerotized patches, terga 8 and 9 darkly sclerotized and forming narrow median bands. Hypoproct broad at base, parallel sided over ninth sternum, apex constricted abruptly to narrow nipple-like tip, which extends to base of epiproct, vesicle absent (Fig. 6). Paraprocts generally broad, inner margin with pointed projection on lateral-apical corner, outer margin formed into narrow band, which encircles base of cercus (Fig. 6). Epiproct composed mostly of large ventral sclerite, darkly sclerotized and forming boat-like keel that is broad at base and narrows down to pointed apex, dorsal aspect with sclerotized area in anterior $\frac{1}{3}$, ventral portion rounded, naked of spines and darkly sclerotized, base with irregularly rounded margin that is notched near dorsal lateral surface, patch of small spines present below notch; dorsal sclerite small but darkly sclerotized, with sharp anterior projection and more blunt posterior projection that has jagged, tooth-like structures at apex, forming rounded process (epihook), that rotates in and out of ventral sclerite; basal sclerites large, darkly sclerotized and triangle shaped (Figs. 4, 5).

Female: Macropterous to slightly brachypterous. Length of forewings 5.5–6.5 mm; length of body 6.0–7.0 mm. Body, appendages and wings similar to male. Subgenital plate mostly lightly sclerotized medially, with darkly colored, Y-shaped pattern over vaginal opening, posterior-lateral margins more darkly sclerotized. Pre-genital plate large and broadly rounded posteriorly, only lightly sclerotized except for darker round patch medially near base of "Y" on segment eight (Fig. 14).

Diagnosis: *Paranemoura claasseni* is most distinctive in the shape of the male epiproct. In dorsal view, the epiproct is more expanded medially in *P. claasseni* (Figs. 4, 10) than in *P. perfecta* (Figs. 1, 7). The lateral margin of the ventral sclerite is notched in *P. claasseni* (Fig. 11), where it is smoothly rounded in *P. perfecta* (Fig. 8). Additionally, the epihook of the dorsal sclerite is bluntly pointed with jagged teeth

where it extends outward in *P. claasseni* (Fig. 11), while in *P. perfecta* it is smooth and sharply pointed (Fig. 8). The females are difficult to separate without associated males.

Type material: Holotype ♂, allotype ♀ and 119 ♂ and 6 ♀ paratypes from Maine, Kennebec County, Crystal Spring, Rome, 31-V-1987, R.W. Baumann and G.Z. Jacobi. Holotype deposited in the National Museum of Natural History, Smithsonian Institution, Washington, DC. Additional paratypes were examined from the following localities: CANADA: NEW BRUNSWICK: Carleton Co., Gibson Creek, Hwy 105, Northampton, 15-VI-1993, R.W. Baumann and B.C. Kondratieff, 2 ♂, 5 ♀. Charlotte Co., tributary Digdequash River, Hwy 127, south of Dumbarton, 15-VI-1993, R.W. Baumann and B.C. Kondratieff, 42 ♂, 24 ♀. Gloucester Co., Nepisiguit River, Hwy 360, north of Bathurst Mines, 17-VI-1993, R.W. Baumann and B.C. Kondratieff, 2 ♂. Northumberland Co., Barnaby River, Hwy 126, southeast of Barnaby River, 17-VI-1993, R.W. Baumann and B.C. Kondratieff, 12 ♂, 1 ♀. Restigouche Co., Williams Brook, off Hwy 180, north of Mount Carleton Provincial Park, 16-VI-1993, R.W. Baumann and B.C. Kondratieff, 28 ♂, 8 ♀. York Co., tributary of Magaguadavic River, Hwy 3, southeast of Thomston Corner, 14-VI-1993, R.W. Baumann and B.C. Kondratieff, 16 ♂, 33 ♀; Pokiok Stream, Hwy 635, below Lake George, 15-VI-1993, R.W. Baumann and B.C. Kondratieff, 24 ♂, 78 ♀. NOVA SCOTIA: Colchester Co., boggy stream, Hwy 104, 3 km east of Masstown, 22-VI-1993, R.W. Baumann and B.C. Kondratieff, 1 ♂. Halifax Co., Cooks Brook, Hwy 224, Cooks Brook, 23-VI-1993, R.W. Baumann and B.C. Kondratieff, 46 ♂, 29 ♀; Gays River, junction Hwys 277 and 224, Carrolls Corner, 23-VI-1993, R.W. Baumann and B.C. Kondratieff, 1 ♂, 4 ♀. PRINCE EDWARD ISLAND: Prince Co., headwaters Grand River, Hwy 177, south of Wellington, 18-VI-1993, R.W. Baumann and B.C. Kondratieff, 6 ♂, 4 ♀. QUEBEC: Saguenay

Co., Matamek River, 30 km east of Sept-Iles, VI-1975, N.E. Williams, 1 ♂, 2 ♀. UNITED STATES: MAINE: Waldo Co., Halfmoon Stream, Hwy 220, Thorndike, 13-IV-1993, R.W. Baumann, B.C. Kondratieff and D.S. Potter, 3 ♂, 1 ♀. Washington Co., Narraguagus River, Hwy 9, 5-V-1973, T.M. Mingo, 1 ♂, 2 ♀; Tomah Stream, Hwy 6, southwest of Vanceboro, 4-V-1982, T.M. Mingo, 1 ♂, 1 ♀; 30-V-1982, 3 ♂; southeast of Topsfield, 14-VI-1993, R.W. Baumann and B.C. Kondratieff, 76 ♂, 80 ♀. NEW HAMPSHIRE: Coos Co., Pittsburg, 22-VI-1954, R.L. Blicke, 4 ♂, 6 ♀.

Additional *Paranemoura* records.— Since it is not possible to make specific determinations without male adults, a number of localities were not included under either of the named species. This problem is especially apparent in the more northern areas of Canada and the United States, where it is possible to find both *Paranemoura* species at the same site. The southern records probably all refer to *P. perfecta* but where the dividing line occurs in New England is not known. Thus the following distribution records are included, where only female specimens have been collected. CANADA: NEW BRUNSWICK: Queens Co., Gagetown, 6-VI-1933, C.E. Atwood, 2 ♀; Number Ten Brook, Hwy 101, Clarendon, 25-VI-1993, R.W. Baumann and B.C. Kondratieff, 1 ♀. Northumberland Co., Halcomb, 8-VII-1951, E.E. Gilbert, 4 ♀. Sunbury Co., Oromocto River, Hwy 101, Tracy, 25-VI-1993, R.W. Baumann and B.C. Kondratieff, 3 ♀. NOVA SCOTIA: Hants Co., Herbert River, Hwy 14, 23-VI-1993, R.W. Baumann and B.C. Kondratieff, 2 ♀. Queens Co., boggy stream, Hwy 210, above Beavertail Basin, 24-VI-1993, R.W. Baumann and B.C. Kondratieff, 8 ♀. ONTARIO: Frontenac Co., 2 miles from Snow Road, 21-IV-1968, W.E. Ricker, 2 ♀. Nipissing Co., Cache Lake, Algonquin Park, 4-VI-1936, W.M. Sprules, 1 ♀; Head Lake, Algonquin Park, 9-VI-1936, W.M. Sprules, 1 ♀. Renfrew Co., Meridian Road, Forest Station, Petawawa, 28-V-1959, J.R. Vockerath, 1 ♀. PRINCE EDWARD

ISLAND: Kings Co., Morell River, Hwy 320, Riverton, 20-VI-1993, R.W. Baumann and B.C. Kondratieff, 1 ♀. QUEBEC: Chicoutimi Co., Pikauba River, Laurentides Park, 21-VII-1938, V.D. Vladykov, 1 ♀. Gatineau Co., Fortune Creek, ridge road, Gatineau Park, 31-V-1964, W.E. Ricker, 1 ♀. Joliette Co., Mont Tremblant Park: Ruisseau Beattie, 11-VI-1957, A. Robert, 2 ♀; Ruisseau des Erables, 19-VI-1959, A. Robert, 1 ♀; 30-VI-1961, 1 ♀. Témiscamingue Co., Temiskaming, 22-VII-1939, F.P. Ide, 1 ♀. UNITED STATES: CONNECTICUT: Tolland Co., Storrs, 4-V-1959, Camp, 1 ♀; 12-V-1959, Rizzo, 1 ♀. MAINE: Aroostock Co., Madawaska Lake, Stockholm, 17-VI-1953, J.F. Hanson, 2 ♀; 8-VII-1953, 1 ♀; Masardis, 13-VII-1960, A.E. Brower, 1 ♀. Franklin Co., Rangeley, 19-VI-1960, 1 ♀. Hancock Co., Lake Wood, Mount Desert Island, 13-VI-1953, M.E. Smith, 1 ♀. Oxford Co., Newton Brook, Hwy 2, Newton Brook Rest Area, 31-V-1987, R.W. Baumann and J.Z. Jacobi, 2 ♀. Penobscot Co., Pushaw Stream, Hwy 43, Hirundo Wildlife Sanctuary, 9-VI-1982, T.M. Mingo, 4 ♀. Piscataquis Co., Bennett Brook, Hwy CC, 5 miles west of Hwy 15, 11-VI-1993, R.W. Baumann, B.C. Kondratieff and D.S. Potter, 2 ♀. Somerset Co., East Branch Sandy Stream, Hwy 101, north of Denniston, R.W. Baumann, B.C. Kondratieff and D.S. Potter, 7 ♀; headwaters South Fork Penobscot River, Hwy 210, 12-VI-1993, R.W. Baumann, B.C. Kondratieff and D.S. Potter, 5 ♀; Trout Brook, Hwy 15, above Long Lake, 12-VI-1993, R.W. Baumann, B.C. Kondratieff and D.S. Potter, 11 ♀. Waldo Co., Webb Brook, Webb Road, Thorndike, 5-VI-1993, D.S. Potter, 2 ♀. MASSACHUSETTS: Berkshire Co., brooklet 1 mile north of Hwy 20, October Mountain State Forest, 27-IV-1991, R.W. Baumann and M.F. Whiting, 2 ♀. NEW HAMPSHIRE: Grafton Co., Dorchester, 13-VI-1964, S.W. Hitchcock, 1 ♀. NEW JERSEY: Gloucester Co., Iona, 21-IV-1907, ?, 1 ♀. Sussex Co., Little Flat Brook, Hwy 650, southeast of Milford, 5-V-1991, R.W. Baumann and

S.A. Wells, 1 ♀. NEW YORK: Franklin Co., Halfway Brook, Hwy 3, between Middle and Lower Saranac Lakes, Adirondack Park, 29-IV-1991, R.W. Baumann and M.F. Whiting, 2 ♀. Hamilton Co., Dog Creek, tributary Sacandaga River, Hwy 30, 5 miles south of Lake Algonquin, Adirondack Park, 30-IV-1991, R.W. Baumann and M.F. Whiting, 1 ♀; Grampus Brook, Hwy 30, below Grampus Lake, Adirondack Park, 29-IV-1991, R.W. Baumann and M.F. Whiting, 1 ♀. Herkimer Co., Old Forg, 26-VI-1905, ?, 1 ♀. VIRGINIA: Bath Co., tributary Wilson Creek, Hwy 629, 1 mile south of Douthat State Park, 12-V-1979, C.R. Parker, 1 ♀. Botetourt Co., Buchanan, 22-IV-1974, R.L. Hoffman, 2 ♀. Tazewell Co., East Fork Cove Creek, Hwy 662, 1.5 miles north of Cove Creek, 16-V-1994, R.W. Baumann, R.F. Kirchner and B.C. Kondratieff, 4 ♀. WEST VIRGINIA: Pendleton Co., headwaters Seneca Creek, Judy Springs Trail, 15-V-1990, R.W. Baumann, R.F. Kirchner, B.C. Kondratieff and J.L. Welch, 10 ♀. Raleigh Co., Cherry Creek, tributary of Beaver Creek, 1 mile south of Cherry Creek, 1-V-1987, B.C. Kondratieff, 7 ♀; tributary Little Beaver Lake, Little Beaver State Park, 25-V-1990, R.W. Baumann and S.M. Clark.

Discussion.—*Paranemoura* has been considered a monotypic genus for thirty years. Specimens are rarely collected by most field workers, so adequate material has not been available until recently. However, intensive collecting in the correct habitats, using a beating sheet or searching on tree trunks near streams, has proven to be quite effective. Since adult males are needed for specific determination and since both species often occur in the same stream, it is useful to collect a large series of adults.

Paranemoura perfecta is widely distributed from the Great Smoky Mountains in the South to the Canadian Maritime Provinces in the North. In contrast *P. claasseni* appears to be restricted to the extreme east-

ern provinces of Canada and the northern New England States in the United States.

ACKNOWLEDGMENTS

The help of the following institutions and individuals, who made their *Paranemoura* specimens available, is greatly appreciated: Stephen Brooks and Peter Ward, the Museum of Natural History (TMNH); Shawn Clark, West Virginia Department of Agriculture; Richard Duffield, Howard University; Jane Earle, Mount Holly Springs, Pennsylvania; Oliver S. Flint, Jr. and Nancy Adams, Smithsonian Institution; Scott Grubbs, University of Pittsburg; Peter Harper, University of Montreal; Stephen Hitchcock, Haddam, Connecticut; Richard Hoebeke, Cornell University (CUIC); Noel Hynes, Waterloo, Ontario; Fred Kirchner, Huntington, West Virginia; Boris Kondratieff, Colorado State University; Jack Martin and Raymond Hutchinson, Canadian National Collection; Ed Masteller, Pennsylvania State University Behrend Campus; Terry Mingo, University of Maine; Charles Nelson, University of Tennessee, Chattanooga; Philip Perkins and David Furth, Museum of Comparative Zoology; David Potter, Unity College; William Ricker, Nanaimo, British Columbia; Donald Webb and Kathy Methven, Illinois Natural History Survey; Reese Voshell, Virginia Polytechnic Institute and State University. In addition, I recognize the following individuals that collected with me in eastern North America, when *Paranemoura* specimens were obtained: Shawn Clark, Gerald Jacobi, Fred Kirchner, Boris Kondratieff, David Potter, Michael Whiting, and Sam Wells. The illustrations were made by Jean Stanger-Leavitt and Debra Horner.

LITERATURE CITED

- Claassen, P. W. 1923. New species of North American Plecoptera. *Canadian Entomologist* 55: 257-263, 281-292.
- Harper, P. P. and H. B. N. Hynes. 1971. The nymphs of the Nemouridae of eastern Canada. *Canadian Journal of Zoology* 49: 1129-1142.
- Hitchcock, S. W. 1974. *Guide to the insects of Con-*

- necticut. Part VII. The Plecoptera or stoneflies of Connecticut. *Bulletin of the State Geological and Natural History Survey of Connecticut* 107: 1-262.
- Illies, J. 1966. *Katalog der rezenten Plecoptera*. Das Tierreich, 82. Walter de Gruyter, Berlin. 632 pp.
- Kondratieff, B. C. and J. R. Voshell, Jr. 1979. A checklist of the stoneflies (Plecoptera) of Virginia. *Entomological News* 90: 241-246.
- Needham, J. G. and P. W. Claassen. 1925. A monograph of the Plecoptera or stoneflies of America north of Mexico. Thomas Say Foundation, Entomological Society of America 2:1-397.
- Ricker, W. E. 1938. Notes on specimens of American Plecoptera in European collections. *Transactions of the Royal Canadian Institute* 47: 129-156.
- . 1952. Systematic studies in Plecoptera. *Indiana University Publications, Science Series* 18: 1-200.
- Ricker, W. E., R. Malouin, P. Harper, and H. H. Ross. 1968. Distribution of Quebec stoneflies (Plecoptera). *Naturaliste Canadien* 95: 1085-1123.
- Stark, B. P., S. W. Sczytko and R. W. Baumann. 1986. North American stoneflies (Plecoptera): systematics, distribution, and taxonomic references. *Great Basin Naturalist* 46: 383-397.
- Surdick, R. F. and K. C. Kim. 1976. Stoneflies (Plecoptera) of Pennsylvania: A synopsis. *Bulletin of the Pennsylvania Agricultural Experiment Station* 808: 1-73.
- Walker, F. 1852. Perlides. *In* *Catalogue of the specimens of neuropterous insects in the collection of the British Museum*, I. Phryganides-Perlides, pp. 136-192.